

# Japanese Paper: History and Process

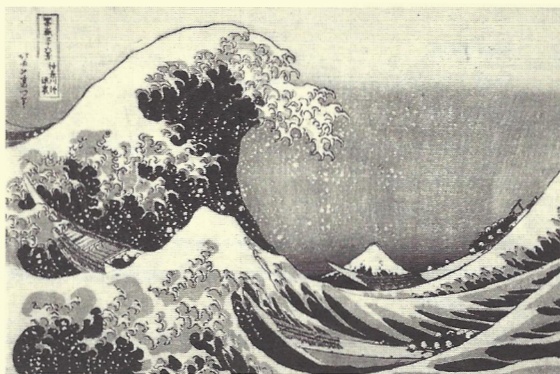
An artist demonstration in conjunction with the exhibition *Hokusai and Hiroshige: Great Japanese Prints from the James A. Michener Collection, Honolulu Academy of Arts*

**Hokusai:**

September 23 - November 15, 1998

**Hiroshige:**

November 21 - January 17, 1999



"Under the Wave of Kanagawa," ("Great Wave") from *Thirty-six Views of Mt. Fuji*, approx. 1830, Courtesy of Honolulu Academy of Arts

Japanese paper is not made from rice! It is made from several species of mulberry. The prints you will be viewing were printed on *kozo*. Other species used in paper production include *gampi* and *mitsumata*.

Around 105 CE in China, Ts'ai Lun (privy counselor to the Emperor) announced the invention of paper made from mulberry and other barks, fish-nets, hemp, and rags. Papermaking entered Japan with the spread of Buddhism and became firmly established by 700 CE.

Japanese farmers began making paper as a source of income in the winter. They pruned the cultivated mulberry in late fall, stripped the bark, and cooked the bast in large vats, then made paper until time for spring planting.

The process of making paper involves cooking the fibers with wood ash or soda ash. The fibers are then cleaned, rinsed, and beaten with mallets or other tools. The resulting pulp is next mixed with a formation aid that will strengthen the sheets and permit them to be separated without sticking after they have been stacked.

The formation aid and pulp are mixed with water. A mold is dipped into the water where it collects some of the suspended pulp to form a sheet of paper. The sheets are pressed and dried to yield Japanese paper. True paper involves a chemical change in the fiber. Beating forces water molecules into the fiber; the subsequent pressing of the fiber causes a hydrogen bonding that is not reversible. Precursors of paper such as *tapa* and *papyrus* include only a physical bonding of the fiber.



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## Preparing the Pulp

The paper you will make at the museum uses a combination of traditional and contemporary materials and techniques that have been adapted for easy use.

### 1. **SOAKING:**

Soak 1 lb. *kozo* or *gampi* overnight

### 2. **COOKING:**

1 lb. *kozo* or *gampi*

2.5 gallons water

2-3.5 oz. soda ash

Heat water. Add soda ash just before water has reached a low boil. Stir. Add fiber. Simmer covered for 2 hours. Turn fiber every half hour. Use only stainless steel, glass, or enameled pots (no aluminum!)

### 3. **CLEANING:**

Drain fiber, then wash 3 times (I usually do it 5 times) until all the lignen has washed out and the water is clear. Put fiber in a tub of water and pick out any matter you do not want in your finished sheets.

### 4. **BEATING:**

Use long hardwood sticks, a rubber or wood mallet, or stones as beating tools. Divide cleaned fiber into 4 oz. bundles. Arrange lengths on the table so that they are parallel to one another. Beat for approximately 25 minutes, or until fiber is 1/2 to 1 inch long. Fiber flinging into the air is a good sign that it is breaking up correctly. Test length of fiber by putting small amounts of it in 1/2 cup water in a jar and shaking. If the fiber disperses easily, it has been adequately beaten.

### 5. **SYNTHETIC TORORO AOI ROOT** (prepare 1 day prior to sheet forming)

1/4 tsp. *neri*

1 qt. Water

Add *neri* very slowly and mix by hand or in blender. Put into the refrigerator overnight.

### 6. **SHEET FORMING:**

5 gallons water

1-1 1/2 bundles fiber

1 qt. *neri* (to start)

Put fiber in tub with water, then strain (using hylon netting) *neri* into tub and mix. Add more *neri* if needed. Solution should be ropey and viscous, but with no globules. Roll finished sheets onto wet felt. Justify edges so post is straight. Put string between the sheets for separating after pressing. Add to pulp as an internal sizing and formation aid. Water should be viscous and "stringy."

Proceed with the sheet forming and drying.

### 7. **PRESSING:**

Put dry felt on post. Press gradually for four hours.

### 8. **DRYING:**

"Paint" sheets on clean windowpanes or plexiglass or wooden boards until dry. Peel off carefully. Voila!

## Resources for supplies:

Magnolia Papermaking  
2427 Magnolia  
Oakland, CA 94607  
(510) 839-5268

Twinrocker Handmade paper  
PO Box 413  
Brookston, IN 47923

Japanese paper requires slow, steady pressing for at least four hours. What follows is a simple plan for pressing small quantities of paper at home. If you do not have an appropriate space for pressing, you can put the press in a large plastic tray or "tub" that you make with clothespins and plastic tarps.

**1. PRESS BOARDS:**

2 pieces 3/4" interior plywood

3 pieces dry felt (from wool blanket, etc.) + 1 wet felt

Cut 2 pieces of plywood that will be a bit larger than the paper you are pressing.

Sand the edges and round the corners of the plywood.

Verathane all sides of both pieces.

2. Place dry felt and top press board over paper post. (You will have used the bottom platen and wet felt when couching the paper).
3. If you must move the paper post, do it carefully and keep it level.
4. Carefully rest a garbage can containing 2 qts. water on the top press board. Add 2 qts. water every 15 minutes until 1 hour has passed. Then, adjust a hose to trickle water into the can until 3 hours have passed and the can is full. Make sure the whole apparatus is level!
5. After 3 hours, carefully lift the can off the pressboards. If the post is still damp or soggy, replace the top felt with a dry one, invert the assembly, replace the bottom felt with a dry one, invert to original stacking position, and return the garbage can to the top of the stack. Leave for an additional 30 minutes.
6. After the second pressing, your paper should be compacted and damp, but not soggy. You are now ready to part the papers.

*Remember! These are general guidelines. The paper you are making will vary according to age and type of the fiber, conditions of the atmosphere, etc. Repeated efforts will yield great results! Instructions were adapted from Japanese Papermaking by Timothy Barrett.*

**Information is compiled from the following sources:**

Timothy Barrett, *Japanese Papermaking*

Dard Hunter, *Papermaking: The History and Technique of an Ancient Craft*

Margaret Prentiss, *Printmaker, Twinrocker Papers, and Professor, University of Oregon*



**Nagashi-zuki style of papermaking** (also called the “slosh” method) It involves several charges (dips) into the vat, the use of a flexible *sugeta* (mold), the addition of a viscous solution to the stock, couching without using felts, and slow, light pressing. In these ways, Japanese paper is absolutely distinct from *Tame-zuki* (Western papermaking)

**Bast** The pale layer of cellulose under the bark that conducts water through the plant.

**Naginata beater** Unlike the hollander used in Western papermaking, the *naginata* beater is much more gentle. It has curved “knives” of wood. It does not macerate the fiber; instead, it aids in the dispersal of fiber for sheet forming.

**Neri** A general term for any viscous formation aid added to the vat. *Neri* aids in the strength of the sheet and permits the separation of the sheets of paper without sticking and is a synthetic alternative to the traditional tororo-aoi root.

**Sugeta** A word formed from *su*, the flexible removable mold surface traditionally made of bamboo splints woven together with silk threads, and *geta* or *keta*, the frame of the mold.

**Maze** (pronounced mah zeh) A comblike mixing device suspended above the papermaking vat.

**Post** A stack of newly made paper.

**Couching** The act of stacking the wet paper on the post.

**Sizing agent** Any material added to paper that increases the sheet’s resistance to penetration by liquids. Sizing is internal and external.

**Sulphite** A pH-balanced wood fiber used as a filler with *kozo* and *gampi*.

**Washi** From *wa* (Japan) and *shi* (paper), a general term which refers to Japanese handmade paper.

### Local Resources:

Materials and classes:	Magnolia Paper, Oakland
Asian handmade papers:	Pearl Art Supplies, San Francisco; Flax, San Francisco
	Amsterdam Art, Berkeley

*The paper press was adapted by Terry McClain from a traditional mode that used a tree stump. The paper press, vat, and beaters were constructed by Jerry Radcliffe.*

*Terry McClain received her MFA from the University of Oregon where she studied Japanese papermaking and fiber techniques.*

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